Claims

1. A system for improving noise immunity for a resistive temperature device (RTD) module, comprising:

an RTD system which includes a plurality of resistive temperature devices (RTDs) and an RTD bank assembly to which the RTDs are connected, the RTD bank assembly including a current source applied successively to the RTDs connected thereto, a switching means for switching the current source successively between the plurality of RTDs in a known sequence, and a measurement assembly for measuring the voltage drop across each RTD when the current source is connected thereto, the RTD system further including a calculation circuit for calculating the resistance of the RTD from the current applied thereto and the voltage drop thereacross;

a plurality of low pass filters associated, respectively, with the plurality of RTDs, wherein when the voltage across an RTD is applied to its associated low pass filter, the low pass filter charges over time, wherein the voltage on the low pass filter is not used in calculating resistance of an RTD until the low pass filter associated with the RTD reaches a preselected level of charge wherein the plurality of low pass filters are charged in turn and the voltage thereon sampled; and

a system for successively precharging low pass filters associated, respectively, with successive RTDs prior to sampling thereof, so that delay in sampling is significantly reduced.

2. The system of claim 1, wherein the low pass filter being precharged is the next one to be voltage sampled.

3. The system of claim 1, wherein said low pass filter is fully charged before voltage sampling thereof is accomplished.

4. The system of claim 1, including a single plurality of RTDs and a single RTD bank associated therewith, the system further including a second voltage source and a second switching means such that one low pass filter can be precharged by one current

source and thereof the voltage thereon sampled while a prior charged low pass filter by the other current source is voltage sampled.

5. The system of claim 1, including at least two plurality of RTDs, each plurality of RTDs having an RTD bank assembly associated therewith, wherein in operation a low pass filter associated with an RTD in one plurality of RTDs is voltage sampled while a low pass filter associated with an RTD in another plurality of RTDs is being precharged, wherein sampling/precharging occurs in sequence between the pluralities of RTDs.

6. The system of claim 1, wherein the voltage and the low pass filter is sampled by the measurement system prior to the low pass filter being fully charged, such that the sampled voltage has an error, the system further including an calibration resistor and a low pass filter associated therewith, the calibration resistor having a preselected resistance value correlated within the resistance of the RTD at a selected temperature, wherein a sampling is made of the voltage on the low pass filter associated with the calibration resistor when the low pass filter is at the same charge level as the charge level of the low pass filter associated with the RTD, wherein the system further includes a dividing circuit for dividing the sampled voltage value from the low pass filter associated with the calibration resistor into the sampled voltage value from the low pass filter associated with the RTD, resulting in a correct ratio value which is correlated with a voltage value for a fully charged low pass filter.

7. A system for improving noise immunity in an RTD, comprising:

an RTD system which includes a plurality of RTDs and an RTD bank assembly to which the RTDs are connected, the RTD bank assembly including a current source for the application to the RTDs, a switching system for switching the current source between the RTDs and a measurement assembly for measuring the voltage across the RTDs in response to the current being connected thereto, the RTD system

further including a calculation function for determining the resistance of the RTD from the voltage and current measurements;

a plurality of low pass filters associated, respectively, with each RTD in the plurality of RTDs, wherein the low pass filters are charged only to a selected level which is less than a full charge level before voltage sampling thereof is carried out; and

at least one RTD calibration resistor and a low pass filter associated therewith, the calibration resistor having a preselected value and connected such that voltage sampling of the low pass filter associated with the RTD and the low pass filter associated with the calibration resistor are made at the same level of charge of the low pass filters prior to full charge, the sampled voltage values being used to produce a resulting value which is correlated with a voltage value produced when the low pass filter associated with the RTD is fully charged, wherein the delay between sampling successive RTDs is thereby reduced.

8. The system of claim 7, including a separate calibration resistor and low pass filter for each different type of RTD in the plurality of RTDs.

9. The system of claim 7, wherein the preselected resistance of the calibration resistor at 0°C is correlated with the resistance of the RTD with which it is associated at 0°C.

10. The system of claim 7, wherein the value of the sampled voltage from the low pass filter associated with the calibration resistor is divided into the value of sampled voltage from the low pass filter associated with the RTD to produce the resulting value.